Course title: Polymer nanocomposites and their applications

Status: elective

ECTS: 15

Requirements:

Learning objectives:

Students obtain the basic knowledge of physics of nanocomposites and their applications.

Learning outcomes

After finishing the course, students should have developed:

- General abilities: basic knowledge from this field, following the literature;
- Subject-specific abilities: students have an insight into the newest achievements in the field of polymer nanocomposites; students learn about their structure, types, design, synthesis techniques, characterization and applications.

Syllabus

Theoretical instruction

Fundamental materials in the technology of polymer nanocomposites. Polymer nanocomposites based on layered sylicates. Polymer nanocomposites based on carbon nanotubes and nanofibers. Polymer nanocomposites based on inorganic nanoparticles. Composites of conductive polymers and inorganic nanoparticles. Characterization of polymer nanocomposites. Applications of polymer nanocomposites.

Practical instruction

Solving practical problems related with this area of science.

Recommended literature

1 Siegmar Roth, David Caroll, *One – Dimensional Metals*, WILEY-VCH Verlag GmbH & Co., Weinheim, 2004.
2 L. H. Sperling, *Introduction to Physical Polymer Science*, John Wiley & Sons, Inc., New Jersey, 2006.
3 M. Rubinstein and R.H. Colby, *Polymer Physics*, Oxford University Press, 2003.
4 J.M.G. Cowie and V. Arrighi, *Polymers: Chemistry and Physics of Modern Materials*, 3rd edition, CRC Press 2007.
5 F. Gao, Advances in polymer nanocomposites, Woodhead publishing, USA, 2012.
6 P. M. Ajayan, L. S. Schadler, P. V. Braun, *Nanocomposite Science and Technology*, WILEY-VCH Verlag GmbH & Co., Weinheim, 2003.
7 **D. M. Petrović, S. R. Lukić, *Eksperimentalna fizika kondenzovane materije,* Edicija "Univerzitetski udžbenik", Univerzitet u Novom Sadu, Novi Sad, 2000**
8 J. A. Brydson, *Plastics materia1s* - 7th ed, Butterworth-Heinemann, Oxford, 1999.

Weekly teaching load:	Lectures: 6	Student research: 4